PROJECT LEAD THE WAY – BIOMEDICAL SCIENCES

Indiana State Approved Course Titles and Descriptions

Indiana Department of Education
College and Career Readiness
151 West Ohio Street
Indianapolis, IN 46204

PROJECT LEAD THE WAY - BIOMEDICAL SCIENCES

Teacher Requirements:
http://www.doe.in.gov/educatorlicensing/pdf/AssignmentCode.pdf

HUMAN BODY SYSTEMS

5216 *(HUMAN SYST)*

Human Body Systems is a course designed to engage students in the study of basic human physiology and the care and maintenance required to support the complex systems. Using a focus on human health, students will employ a variety of monitors to examine body systems (respiratory, circulatory, and nervous) at rest and under stress, and observe the interactions between the various body systems. Students will use appropriate software to design and build systems to monitor body functions. Schools must agree to be part of the Project Lead the Way network and follow all training and data collection requirements.

- Suggested Grade Level: 10th grade or permission of instructor
- Recommended Prerequisite: Principles of the Biomedical Sciences
- Credits: One credit per semester, a two semester course
- Fulfills the requirements of a Life Science course for the General, Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diplomas

MEDICAL INTERVENTION

5217 *(MED INTERV))*

Medical Intervention is a course that studies medical practices including interventions to support humans in treating disease and maintaining health. Using a project-based learning approach, students will investigate various medical interventions that extend and improve quality of life, including gene therapy, pharmacology, surgery, prosthetics, rehabilitation, and supportive care. Students will also study the design and development of various interventions including vascular stents, cochlear implants, and prosthetic limbs. Lessons will cover the history of organ transplants and gene therapy with additional readings from current scientific literature addressing cutting edge developments. Using 3-D imaging software, students will design and build a model of a therapeutic protein. Schools must agree to be part of the Project Lead The Way network and follow all training and data collection requirements.

- Suggested Grade Level: 11th grade or permission of instructor
- Recommended Prerequisites: Principles of the Biomedical Sciences and Human Body Systems
- Credits: One credit per semester, a two semester course
- Fulfills the requirements of a Life Science course for the General, Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diplomas

PRINCIPLES OF THE BIOMEDICAL SCIENCES

5218 *(PRIN BIOMED)*

Principles of the Biomedical Sciences provides an introduction to this field through “hands-on” projects and problems. Student work involves the study of human medicine, research processes and an introduction to bioinformatics. Students investigate the human body systems and various health conditions including heart disease, diabetes, hypercholesterolemia, and infectious diseases. A theme through the course is to determine the factors that led to the death of a fictional person. After determining the factors responsible for the death, the students investigate lifestyle choices and medical treatments that might have prolonged the person’s life.

Key biological concepts included in the curriculum are: homeostasis, metabolism, inheritance of traits, feedback systems, and defense against disease. Engineering principles such as the design process, feedback loops, fluid dynamics, and the relationship of structure to function will be included where appropriate. The course is designed to provide an overview of all courses in the Biomedical Sciences program and to lay the scientific foundation necessary for student success in the subsequent courses. Schools must agree to be part of the Project Lead the Way network and follow all training and data collection requirements.

- Suggested Grade Level: 9th grade or permission from instructor
- Prerequisite: Biology I or concurrent enrollment in Biology I is required
- Credits: One credit per semester, a two semester course
- Fulfills the requirements of a Life Science course for the General, Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diplomas

BIOMEDICAL INNOVATIONS

5219 *(BIO INN)*

Biomedical Innovations is a capstone course designed to give student teams the opportunity to work with one or more mentors from the scientific and/or medical community. Teams will identify a research topic, conduct research, write a scientific paper, and defend team conclusions and recommendations to a panel of outside reviewers. Students taking this course may consider working with peers enrolled in a PLTW: Pre-Engineering capstone course to jointly engineer a product that could impact healthcare.

- Suggested Grade Level: 12th grade or permission of the instructor
- Recommended Prerequisites: Principles of the Biomedical Sciences, Human Body Systems and Medical Intervention
- Credits: One credit per semester, a two semester course
- Fulfills the requirements of a Life Science course for the General, Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diplomas